PUBLIC NOTICE

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Office of Engineering and Technology, Wireless Telecommunications Bureau, and International Bureau Announce Agenda for Workshop and Tech Demonstration on Spectrum Frontiers and Technological Developments in the Millimeter Wave Bands

The FCC's Office of Engineering and Technology, Wireless Telecommunications Bureau, and the International Bureau will host a workshop exploring the concepts raised in the Commission's *Spectrum Frontiers NPRM* and the state of technological developments in the millimeter wave (mmW) bands. In parallel to the workshop, OET, WTB, and IB will host equipment demonstrations illustrating some of the technologies enabling advanced wireless services in the mmW bands. The workshop and tech demonstration will be held on **Thursday, March 10, 2016, from 9:00am to 5:00pm ET in the Commission Meeting Room at FCC Headquarters, 445 12th Street, SW, Washington, DC**.

This workshop will explore the technologies that are enabling mobile broadband services in the mmW bands, the spectrum requirements, opportunities and applications for new and incumbent service providers, the benefits to consumers, methods for creating a shared spectrum environment with incumbents, and other issues raised in the *Spectrum Frontiers NPRM*. The workshop will include perspectives from equipment manufacturers, licensees, wireless service providers, satellite service providers, and various other interested parties. The workshop is open to the public and will be streamed live on the FCC's website; see below for details.

Workshop Agenda

9:00am **Opening Remarks**
Tom Wheeler, Chairman, Federal Communications Commission

Remarks
Michael O'Rielly, Commissioner, Federal Communications Commission

Keynote
Ted Rappaport, David Lee/Ernst Weber professor of electrical engineering at NYU, and founding Director of NYU Wireless

9:40am – 10:50am **Panel 1: Envisioned Services, Applications, and Deployment of Next Generation Wireless Technologies**
Asha Keddy, Vice President and General Manager, Intel
Erwin Hudson, Vice President, Australia/SE Asia, ViaSat
Dave Parish, Manager of Wireless Systems, Google
Joe Lipowski, Chief Technology Officer, Starry
Sanyogita Shamsunder, Director of Wireless Technology, Verizon Wireless

Moderators: Brian Regan, Associate Chief, Wireless Telecommunications Bureau; Stephen Buenzow, Deputy Chief, Broadband Division, Wireless Telecommunications Bureau

10:50am – 12:10pm **Panel 2: Enabling Technologies of Next Generation Wireless Systems**
Amitava Ghosh, Nokia Fellow and Head of Small Cell Research, Nokia Bell Labs
Kumar Balachandra, Principal Research Engineer, Ericsson
Matt Grob, Chief Technology Officer, Qualcomm
Paul Steinberg, Chief Technology Officer, Motorola
Thyaga Nandagopal, Program Director, National Science Foundation
Woojune Kim, Vice President of Next Generation Products and Business, Samsung

Moderators: Michael Ha, Deputy Chief, Policy & Rules Division, Office of Engineering and Technology; Jeff Goldthorp, Associate Chief, Public Safety and Homeland Security Bureau

12:10pm – 2:00pm **Lunch Break/Exhibit Demo**

2:00pm – 3:00pm **Panel 3: Creating a Regulatory Scheme for Flexible Use in the mmW Bands**
Harold Feld, Senior Vice President, Public Knowledge
John Hunter, Director of Spectrum Policy, T-Mobile
Jennifer Manner, Vice President of Regulatory Affairs, EchoStar
Joan Marsh, Vice President of Federal Regulatory, AT&T
Davidi Jonas, CEO and President, Straight Path
Michael Daum, Technology Policy Strategist, Microsoft

Moderators: John Schauble, Deputy Chief, Broadband Division, Wireless Telecommunications Bureau; Bob Nelson, Chief Engineer, International Bureau

3:00pm – 4:00pm **Panel 4: Fireside Chat – Furthering Spectrum Policy and Promoting Wireless Technology**
Julius Knapp, Chief, Office of Engineering and Technology
Jon Wilkins, Chief, Wireless Telecommunications Bureau
Paige Atkins, Associate Administrator, NTIA
Nada Golmie, Chief, Wireless Networks Division, NIST
Fred Moorefield, Director, Spectrum Policy and International Engagements, DOD CIO
Renee Gregory, Senior Advisor, White House Office of Science and Technology Policy

4:00pm – 5:00pm **Wrap Up**
Exhibit/Demo closes at 5pm

Technology Demonstration Information

Technology demonstration will be held on Thursday, March 10, 2016, from 10:00am to 5:00pm ET in two locations:

- Training rooms (TW-A402/A442) – Intel and Nokia
- FCC Technology Center – Samsung, Qualcomm, and Ericsson

Below are descriptions of the demonstrations, as provided by the demonstrators:

Intel is leading the convergence of computing and communications connectivity by uniting the industry around new spectrum assignments, frequencies, standards, and innovative technologies such as mmWave, multi-antenna array, steerable beamforming, novel radio interface techniques, anchor-booster architecture and more, in order to make 5G a reality. During the workshop, Intel will demonstrate its 5G Mobile Trial Platform in 60GHz, Mobile Edge mmWave Backhaul and Access for 5G Densification, Pre 5G Anchor Booster Concept with mmW, and Narrowband IOT.

Nokia will demonstrate an experimental 5G system operating in 73 GHz band (E-band). This demonstration shows one GHz bandwidth single link system using null cyclic prefix (CP) single carrier modulation which communicates using steerable lens antenna with a 3 degree beamwidth serving a fully mobile user device with a peak rate of 2.3 Gbps. This system can also support a radio latency of less than 1 msec and multi-user acquisition and tracking.

Samsung will demonstrate very high speed data transmission using 5G technology in the 28GHz band. Data transmission will occur in an indoor wireless 5G prototype system with one base station and one customer premises equipment prototype. The base station will transmit over an 800MHz-wide channel using a Time Division Duplex (TDD) frame structure. The 5G system will achieve a 3.7Gbps link speed using higher order Modulation and Coding Schemes (MCS) and Multiple Input/Multiple Output (MIMO) communication with beam selection.

Qualcomm is looking to 2020, with a unified 5G design that will deliver on connectivity needs—enabling new business opportunities, services and user experiences. Qualcomm will showcase its 5G design and a live streaming demonstration of Millimeter-Wave technology, an important component of 5G.

Ericsson will showcase remotely controlling an actual Volvo Excavator located in Dallas, Texas with a connected simulator located at the FCC HQ. The end user will have a virtual reality headset with live immersive streaming video, and operation of the system via controls in the excavator simulator. With 5G, heavy machinery can be remotely controlled with real-time responsiveness where latency is a critical for safety. One advantage of this approach is that a worker with unique or specialized skills could manage multiple projects around the world in the same work day. Also, real-time remote control of heavy equipment allows for workers to operate in areas that are hostile in terms of weather or personal security.

Attendance. This workshop is open to the public. Due to high number of anticipated attendees and security check-in procedures, all attendees are advised to arrive at least 30 minutes prior to the session of interest. Attendees are not required to pre-register, but may submit their name and company affiliation ahead of time by sending an email to Cecilia Sulhoff (cecilia.sulhoff@fcc.gov) in order to expedite the check-in process.

Webcast. The FCC will webcast the workshop on the FCC webpage. To view the webcast, go to the FCC web page at www.fcc.gov/live. Viewers will be able to submit questions during the workshop by e-mail to livequestions@fcc.gov.

Accessibility Information. Reasonable accommodations for people with disabilities are available upon request. Include a description of the accommodation you will need and tell us how to contact you if we need more information. Make your request as early as possible. Last minute requests will be accepted, but may be impossible to fill. Send an e-mail to fcc504@fcc.gov or call the Consumer and Governmental Affairs Bureau at 202-418-0530 (voice), 202-418-0432 (tty).

For further information on the workshop, contact Michael Ha, Office of Engineering and Technology, at (202) 418-2099 or by email: michael.ha@fcc.gov. For logistical questions, please contact Cecilia Sulhoff, Wireless Telecommunications Bureau, at (202) 418-0587 or by email: cecilia.sulhoff@fcc.gov.

For more news and information about the Federal Communications Commission, please visit: www.fcc.gov.